FINAL REPORT

19980160

ESTABLISHMENT OF FORAGES IN A DIRECT SEEDING SYSTEM

March 2002
Funded by the Agri-Food Innovation Fund

Prepared by: Conservation Learning Centre Inc.

AGRI-FOOD INNOVATION FUND

Canada

Saskatchewan

AGRI-FOOD INNOVATION FUND PROJECT REPORT

PROJECT #: 98000160

PROJECT NAME: Establishment of Forages in a Direct Seeding System

TIME FRAME: April 1, 1999 - February 28, 2002

SUMMARY:
This project provided an illustration of forage establishment in a direct seeding operation. The forages were direct seeded into an area of the farm that had been continuously cropped the past five years. The plots (4' x 20', 4 replicates each) were seeded into wheat stubble and monitored for three years. Standard haying practices were employed.

While establishment varied among varieties and species, the demonstration did show an economic benefit to direct seeding forages that in turn encourages the inclusion of forages in crop rotations.

The effect of fertilizer application as well as time of cutting was also evaluated in the last year of the project. The treatments had no impact on regrowth due to the dry growing conditions.

TECHNICAL REPORT:
Objectives:
1. Demonstrate reduced forage establishment costs
2. Demonstrate forages suitable to the Parkland area of Saskatchewan
3. Demonstrate direct seeding of forages

ACTIVITIES
1999 - 2000
On May 27, 1999, the forage plots were seeded directly into wheat stubble (plot replicates outlined in Figure 1). Residue from the previous wheat crop had been chopped and spread reasonably well. Fertilizer (150 pounds of 12-51-0) was broadcast and the plots were harrow-packed with a coil-spring packer prior to seeding. The plots were seeded with a Hege press drill with packers behind (seeding rates in Table 1). The seeding depth for all forages was 1.5 cm.

In 1999, grass plots were sprayed with Curtail-M and legume plots with Partner at recommended rates. Plots were not cut in 1999. Plots were swathed on July 26, 2000 and the hay manually removed.

Figure 1. Plot replication plan for forage trial

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Replicate 1	Replicate 2	Replicate 3	Replicate 4
Fleet MB	Paddock MB	9197 MB	Fleet MB
Paddock MB	9197 MB	Fleet MB	9197 MB
9197 MB	Fleet MB	Paddock MB	Paddock MB
Carlton SB	Signal SB	Carlton SB	Signal SB
Signal SB	Carlton SB	Magna SB	Magna SB
Magna SB	Magna SB	Signal SB	Carlton SB
Kirk CWG	Kirk CWG	Fairway CWG	Chief IWG
9240 CWG	Fairway CWG	Revenue SWG	Kirk CWG
Fairway CWG	Orbit CWG	Elbee NWG	AC Parkland CWG
Orbit TWG	Revenue SWG	9240 CWG	Orbit TWG
Revenue SWG	Clarke IWG	Chief IWG	Clarke IWG
Chief IWG	Elbee NWG	Rodan WWG	Rodan WWG
Clarke IWG	9240 CWG	Kirk CWG	Elbee NWG
Rodan WWG	Rodan WWG	Orbit TWG	Revenue SWG
Elbee NWG	AC Parkland CWG	AC Parkland CWG	Fairway CWG
AC Parkland CWG	Chief IWG	Clarke IWG	9240 CWG
Arthur Dahurian WRG	Prairieland Altai WRG	Swift Russian WRG	Prairieland Altai WRG
Prairieland Altai WRG	Swift Russian WRG	Arthur Dahurian WRG	Arthur Dahurian WRG
Swift Russian WRG	Arthur Dahurian WRG	Prairieland Altai WRG	Swift Russian WRG
Kay Orchardgrass	Kay Orchardgrass	Courtenay Tall Fescue	Climax Timothy
Courtenay Tall Fescue	Climax Timothy	Climax Timothy	Kay Orchardgrass
Climax Timothy	Courtenay Tall Fescue	Kay Orchardgrass	Courtenay Tall Fescue
Leo Birdsfoot Trefoil	Oxley Cicer Milkvetch	Nova Sainfoin	Cree Birdsfoot Trefoil
Cree Birdsfoot Trefoil	Leo Birdsfoot Trefoil	Oxley Cicer Milkvetch	Nova Sainfoin
Oxley Cicer Milkvetch	Cree Birdsfoot Trefoil	Leo Birdsfoot Trefoil	Oxley Cicer Milkvetch
Nova Sainfoin	Nova Sainfoin	Cree Birdsfoot Trefoil	Leo Birdsfoot Trefoil
Rangelander alfalfa	Apica alfalfa	AC Grazeland alfalfa	Beaver alfalfa
Apica alfalfa	AC Grazeland alfalfa	Beaver alfalfa	Rangelander alfalfa
AC Grazeland alfalfa	Rangelander alfalfa	Apica alfalfa	AC Grazeland alfalfa
Beaver alfalfa	Beaver alfalfa	Rangelander alfalfa	Apica alfalfa

MB	meadow bromegrass	IWG	intermediate wheatgrass
SB	smooth bromegrass	WWG	western wheatgrass
CWG	crested wheatgrass	NWG	northern wheatgrass
TWG	tall wheatgrass	WRG	wildrye grass
SWG	slender wheatgrass		

2001

A demonstration assessing the impact of second cut management with and without fertilization on regrowth was completed. Plots were assessed for spring growth. Replicates 2 and 4 were harvested once (June 21) and replicates 1 and 3 were harvested twice (June 21 and August 3). Replicates 3 and 4 were fertilized with 50 pounds of nitrogen per acre applied as liquid nitrogen (28-0-0).

Table 1. Seeding rates (in pounds per acres)

Leo and Cree birdsfoot trefoil	2.8
Oxley cicer milk vetch	8.0
Nova sainfoin	25.0
Rangelander, Apica, AC Grazeland and Beaver alfalfa	5.2
Fleet, Paddock and 9197 meadow bromegrass	13.1
Carlton, Signal and Magna smooth bromegrass	7.7
Kirk, 9240 and AC Parkland crested wheatgrass	6.0
Fairway crested wheat grass	4.8
Orbit tall wheatgrass	1.3
Revenue slender wheatgrass	6.5
Chief and Clarke intermediate wheatgrass	11.9
Rodan western wheatgrass	9.5
Elbee northern wheatgrass	6.7
Arthur Dahurian wild ryegrass	13.1
Prairieland Altai wild ryegrass	20.5
Swift Russian wild ryegrass	10.5
Kay orchardgrass	1.6
Courtenay tall fescue	4.6
Climax timothy	3.0

ACHIEVEMENTS, ARTICLES, MEDIA

Achievements:

- Personnel representing the CLC participated in and/or hosted ~65 meetings, trade shows, conferences, workshops and field days
- 700 producers, researchers and industry representatives attended field days and workshops
- 4,830 students and youth (~220 groups), as well as ~440 accompanying teachers and parents, participated in the school program
- Nominated for *Canadian Agri-Food Award of Excellence* in "Agricultural Awareness and Education" and "Environmental Stewardship"
- Nominated three times for Outstanding Agriculture Ambassador Award through Agriculture in the Classroom (Saskatchewan)
- Nominated for SSCA Conservation Award
- Listed as an agriculture resource for schools through Agriculture in the Classroom
- Received Award of Recognition from Agriculture in the Classroom

Articles and media material:

- Prairie Steward
- Saskatchewan Human Services Directory
- Saskatchewan Forage Council Newsletter
- Western Producer
- Rural Roots

- Canadian Fertilizer Institute newsletter
- Saskatchewan Advisory Council on Forage Crops
- Saskatchewan Canola Development Commission
- Media interviews (radio, television and print)
- Saskatchewan Agriculture and Food *Farm & Food Report*
- Media interviews (radio, television and print)
- Advertisements and bulk mail-outs for field days and tours

RESULTS AND CONCLUSIONS

In 1999, the forage plots were seeded and emergence was reasonably good. In the spring of 2000, winter survival was very good and production was excellent. Some species suffered severe winter kill during the winter of 2000 due to the lack of snow cover. In the spring of 2001, there is significant reduction in survival of Oxley cicer milkvetch, Cree and Leo birdsfoot trefoil, Courtney tall fescue, Kay orchard grass, Swift Russian wildrye grass, Elbee northern wheatgrass, Rodan western wheatgrass and Revenue slender wheatgrass. As this demonstration was intended to be visual, biomass production was not assessed any of the three years of production.

One of the objectives was to demonstrate reduced forage establishment costs. The differences in costs were as follows:

Conventional	$ 51.27
Direct seeding	
CLC	$ 27.17
Average producer	$ 20.97

Direct seeding significantly reduced seeding costs and soil degradation.

Fertilization with nitrogen in 2001 and the difference in number and timing of harvesting had no impact on regrowth, attributable to the extremely dry conditions. Further study would be necessary to determine if it is economically viable to fertilize for second cut management.

As the plot progressed, producers were able, through visual assessment, to evaluate the demonstrated forage varieties and species as well as the logisitics and economics of the management technique of direct seeding forages.

INNOVATION FUND ACKNOWLEDGEMENT:

- Acknowledgement on sponsor board in farm yard
- Acknowledgement on forage garden signage
- Verbal acknowledgement at field days, tours and presentations
- Acknowledgement on display booth
- Acknowledgement in annual Project Summary (1999-2001)

PROJECT PUBLIC INFORMATION MATERIALS:

As outlined under "Achievements, Articles, Media"